

REMARKS

Applicants respectfully submit that all the claims presently on file are in condition for allowance, which action is earnestly solicited. The claims on file have been amended to more clearly point out the present invention.

INFORMATION DISCLOSURE STATEMENT

Applicants confirm that the intended reference to be cited is 5,328,130.

THE CLAIMS

CLAIMS REJECTIONS UNDER 35 U.S.C. 112, SECOND PARAGRAPH

Claim 7 was rejected under 35 U.S.C. 112, second paragraph, for containing an informality. This informality has now been addressed in satisfaction of 35 U.S.C. 112.

CLAIM REJECTION UNDER 35 U.S.C. 102

A. The Rejection

Claim 1, 4, 7-10, and 12 were rejected under 35 U.S.C. 102(b) as being anticipated by Russell (U.S. Patent No. 463,922). Applicants respectfully submit that Russell does not disclose all the elements and limitations of the independent claim 1. Consequently, claim 1 is not anticipated under 35 U.S.C. 102, and the allowance of this claim and the claims dependent thereon is earnestly solicited. In support of this position, Applicants submit

the following arguments:

B. Legal Standard for Lack of Novelty (Anticipation)

The standard for lack of novelty, that is, for "anticipation," is one of strict identity. To anticipate a claim for a patent, a single prior source must contain all its essential elements, and the burden of proving such anticipation is on the party making such assertion of anticipation. Anticipation cannot be shown by combining more than one reference to show the elements of the claimed invention. The amount of newness and usefulness need only be minuscule to avoid a finding of lack of novelty.

The following are two court opinions in support of Applicant's position of non anticipation, with emphasis added for clarity purposes:

- "Anticipation under Section 102 can be found only if a reference shows exactly what is claimed; where there are differences between the reference disclosures and the claim, a rejection must be based on obviousness under Section 103." *Titanium Metals Corp. v. Banner*, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985).
- "Absence from a cited reference of any element of a claim of a patent negates anticipation of that claim by the reference." *Kloster Speedsteel AB v. Crucible Inc.*, 793 F.2d 1565, 230 USPQ 81 (Fed. Cir. 1986), on rehearing, 231 USPQ 160 (Fed. Cir. 1986).

C. Brief Summary of the Present Invention

Prior to presenting substantive arguments in favor of the allowability of the claims on file, it might be desirable to summarize the present invention. For each operating projectile, an identically shaped training cartridge is required for use in training personnel who will use the real or tactical projectile.

The performance of training projectiles should correspond to the matching real or tactical projectile as closely as possible. Conventional training rounds utilize folding or fixed fin training round designs to achieve a ballistic match to tactical (service) projectiles. Although this technology has proven to be useful, it would be desirable to present additional improvements. What was needed prior to the advent of the present invention was a training projectile with improved static margin and reduced sensitivity to center of pressure shift capable of being fired from smooth bores and rifled cannons of various calibers, including 120 mm and 105 mm.

According to the present invention, a finless cone-nosed, ogival-nosed, or a combination ogive-cone nosed training projectile is designed to be statically stable, yet has adequate spin rate to compensate for aerodynamic or mass asymmetries. In addition, the training projectile can be fired from smooth bored or rifled cannons of various calibers. **Spin torque** and **stability augmentation** are provided by a radially angled slotted tail flange attached to the rear of the **training projectile**, providing high performance and improved accuracy at **low cost** for use in training exercises. The training projectile has a higher static margin than conventional devices, and provides the ability to train personnel with a

training projectile that achieves flight ranges similar to its matching tactical projectile, and has improved accuracy.

D. Application of the Legal Standard of Novelty

Applicants will now present arguments in support of the allowance of representative independent claim 1, and the claims dependent thereon, over Russell.

D.1. Russell does not disclose a projectile with a cylindrical portion and an obturator to prevent forward thrust gases from escaping from the weapon tube

The present training projectile 10 includes a nose forwardmost (front) portion 210 and a rearward or aft cylindrical portion 215 having stabilizer 205 attached thereto. The **outer diameter of cylindrical portion 215 is slightly smaller than the inside diameter of the bore of tube** from which the projectile is fired. **Obturator 220**, is fastened about the cylindrical portion of the projectile 10 to provide a friction fit between the bore of the cannon and projectile 10, in order **to prevent forward thrust gasses from escaping from the bore prior to the escape of the projectile 225 when fired**. The projectile 10 and the stabilizer 205 share a common longitudinal axis 225.

With reference to FIGS. 1 and 2, **Russell** generally describes the rear part of the head or front portion A whose diameter substantially fits the bore of the gun from which the projectile will be fired. **Portion B of the projectile** extends rearward from the head A, and is preferably generally cylindrical in shape. The diameter of the cylinder is a little less than that of the matching component of the projectile-head, so that while the

projectile is in the bore of the gun there will be **an annular space around the portion B between its sides and the walls of the gun-bore. This space enables portions of the propelling-gases in the gun to travel forward around and along the projectile sides to the enlarged head A.**

D.2. Russell does not teach a projectile with a smooth nose.

The **present invention** teaches an ogival shaped nose 210 illustrated in FIG. 3. In one embodiment, the projectile 10 comprises a cone-shaped nose 405 as illustrated by FIG. 4. In a further embodiment, the projectile 10 comprises a combination ogival/conical nose 505 as illustrated by FIG. 5. The combination ogival/conical nose 505 comprises a conical portion 510 and an ogival portion 515. The **nose's surface is smooth and does not include passages or grooves** as in Russell.

Russell generally describes a **projectile head with forwardly extending passages, that open at their rear ends into the space around the reduced portion or body B of the projectile.** Russell explains at column 1, line 42 - column 2, line 1, that the special purpose of Russell's "invention has been to make it possible to use elongated projectiles in smooth-bore or unrifled guns without danger of tumbling and consequent inaccuracy and irregularity in flight and shortness of range. Where conical or elongated projectiles as heretofore made have been fired from a smooth-bore gun or one without rifling, it has been found that they tumbled as soon as they left the guiding bore of the gun. Without rotation on their axes, such as would be given them by the grooves or rifling of a rifled gun; they would not keep point on in their travel through the air." Emphasis added. In order to address this problem and satisfy the goal of the design, Russell describes providing the head with "forwardly extending passages, a' a'."

This concept permeates Russell's patent. Reference is made for example to FIGS. 1, 3 - 5, 7 - 14, and 15 - 16.

Thus, Russell clearly teaches away from the present invention in that it requires a projectile with a rifled nose.

D.3. Russell does not disclose a projectile with a rear stabilizer

With reference to FIG. 2 and to new claims 13 and 14 on file, the **present projectile** includes a **rear stabilizer** 205 that is connected to the rear end of an ogive-nosed shaped projectile and may be made in dimensions to fit a projectile of any smooth bore system. The stabilizer has a cylindrical segment 230 and angled slots 245 on the periphery of cylindrical segment 235. As shown in FIG. 2, the walls of **slots** 245 have a negative slope and as **front Incident air passes through slots** 245 the projectile 10 spins in a clockwise direction (when viewed from the rear). Reversing the slope of the walls of slots 245 will force the projectile to rotate in the counter clockwise direction. The **rear stabilizer uniquely provides spin to stabilize the projectile.**

Russell generally discloses a **projectile head with forwardly extending passages** that **open at their rear ends into the space around the reduced portion or body B of the projectile.** The head is connected to an annular space around the portion B. Russell further discloses that in order to steady and guide the reduced rear part or body of the projectile while the latter is in and traveling along the barrel of a gun, the inventor provides it with a number of projections or lugs b b, which are adapted to engage the walls of the gun-bore and between which are spaces b' b' to allow the forward passage of the propelling-gases from behind the projectile to the

annular space from which the passages a' a' open. The **guiding lugs or projections b b are provided with inclined forwardly-turned abrupt faces.**

Thus, Russell does not describe a projectile with a rear stabilizer that includes two sections of different diameters, as recited in claims 13 and 14.

As a result, based on the foregoing strict legal standard for anticipation, Applicants submit that **Russell does not anticipate claim 1 or the claims dependent thereon.** Thus, the claims on file are allowable and such allowance is earnestly solicited.

CLAIMS REJECTION UNDER 35 U.S.C. 103

A. The Rejection

Claims 2, 3, 5, 6 and 11 were rejected under 35 U.S.C. 103(a) as being unpatentable over Russell, hereinafter referred to as "Russell", as applied above. Applicants respectfully traverse these rejections and submit that none of the cited references discloses the elements and features of the claims on file as a whole, whether considered individually or in combination with each other. To this end, Applicants respectfully submit the following arguments:

B. Legal Standards for Obviousness

The following legal authorities set the general legal standards in support of Applicants' position of non-obviousness, with emphasis added for added clarity:

- MPEP §2143.03, "All Claim Limitations Must Be Taught or Suggested: To establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. In re Royka, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). "All words in a claim must be considered in judging the patentability of that claim against the prior art." In re Wilson, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970). If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)."
- MPEP §2143.01, "The Prior Art Must Suggest The Desirability Of The Claimed Invention: There are three possible sources for a motivation to combine references: the nature of the problem to be solved, the teachings of the prior art, and the knowledge of persons of ordinary skill in the art." In re Rouffet, 149 F.3d 1350, 1357, 47 USPQ2d 1453, 1457-58 (Fed. Cir. 1998) (The combination of the references taught every element of the claimed invention, however without a motivation to combine, a rejection based on a prima facie case of obvious was held improper.). The level of skill in the art cannot be relied upon to provide the suggestion to combine references. Al-Site Corp. v. VSI Int'l Inc., 174 F.3d 1308, 50 USPQ2d 1161 (Fed. Cir. 1999).
- "Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching or suggestion supporting the combination." In re Fine, 837 F.2d at 1075, 5 USPQ2d at 1598 (citing ACS Hosp. Sys. v. Montefiore Hosp., 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed. Cir. 1984)). What a reference teaches and whether it teaches toward or away from the claimed invention are questions of fact. See Raytheon Co. v. Roper Corp., 724 F.2d 951, 960-61, 220 USPQ 592, 599-600 (Fed. Cir. 1983), cert. denied, 469 U.S. 835, 83 L. Ed. 2d 69, 105 S. Ct. 127 (1984). "
- "When a rejection depends on a combination of prior art references, there must be some teaching, suggestion, or motivation to combine the references. See In re Geiger, 815 F.2d 686, 688, 2 USPQ2d 1276, 1278 (Fed. Cir. 1987). "Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See MPEP 2143.01; In re Kotzab, 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000); In re Fine, 837 F.2d 1071, 5 USPQ2d

1596 (Fed. Cir. 1988); and In re Jones, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

- "With respect to core factual findings in a determination of patentability, however, the **Board cannot simply reach conclusions based on its own understanding or experience** – or on its assessment of what would be basic knowledge or common sense. **Rather, the Board must point to some concrete evidence in the record** in support of these findings." See In re Zurko, 258 F.3d 1379 (Fed. Cir. 2001).
- "We have noted that **evidence of a suggestion, teaching, or motivation to combine** may flow from the prior art references themselves, the knowledge of one of ordinary skill in the art, or, in some cases, from the nature of the problem to be solved, see Pro-Mold & Tool Co. v. Great Lakes Plastics, Inc., 75 F.3d 1568, 1573, 37 USPQ2d 1626, 1630 (Fed. Cir. 1996), Para-Ordinance Mfg. v. SGS Imports Intern., Inc., 73 F.3d 1085, 1088, 37 USPQ2d 1237, 1240 (Fed. Cir. 1995), although "the suggestion more often comes from the teachings of the pertinent references," Rouffet, 149 F.3d at 1355, 47 USPQ2d at 1456. The range of sources available, however, does not diminish the requirement for actual evidence. That is, **the showing must be clear and particular**. See, e.g., C.R. Bard, 157 F.3d at 1352, 48 USPQ2d at 1232. **Broad conclusory statements regarding the teaching of multiple references, standing alone, are not "evidence."** E.g., McElmurry v. Arkansas Power & Light Co., 995 F.2d 1576, 1578, 27 USPQ2d 1129, 1131 (Fed. Cir. 1993) ("Mere denials and conclusory statements, however, are not sufficient to establish a genuine issue of material fact."); In re Sichert, 566 F.2d 1154, 1164, 196 USPQ 209, 217 (CCPA 1977)." See In re Dembiczak, 175 F.3d 994 (Fed. Cir. 1999).
- "To prevent the use of hindsight based on the invention to defeat patentability of the invention, **this court requires the examiner to show a motivation to combine the references** that create the case of obviousness. In other words, **the examiner must show reasons** that the skilled artisan, confronted with the same problems as the inventor and with no knowledge of the claimed invention, would select the elements from the cited prior art references **for combination in the manner claimed**." See In re Rouffet, 149, F.3d 1350 (Fed. Cir. 1998).
- The mere fact that references can be combined or modified does not render the resultant combination obvious **unless the prior art also suggests the desirability of the combination**. In re Mills, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990). Although a prior art device "may be

capable of being modified to run the way the apparatus is claimed, there must be a suggestion or motivation in the reference to do so." 916 F.2d at 682, 16 USPQ2d at 1432.). See also In re Fritch, 972 F.2d 1260, 23 USPQ2d 1780 (Fed. Cir. 1992) (flexible landscape edging device which is conformable to a ground surface of varying slope not suggested by combination of prior art references).

- If the proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. In re Gordon, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984).

C. Application of the Obviousness Standard

Russell generally describes that it would be necessary to **give the projectile its steadyling rotation before it reaches and leaves the gun-muzzle**. Such rotation is secured by the action of the propelling-gases themselves upon portions of the projectile while the latter is in and is traveling through the guiding-bore of the gun and without the intervention of or aid of inclined grooves or rifling in the gun. The **projectile is provided with inclined faces situated well forward toward its front end and adapted to be reached and engaged by the gases passing forward along or around the sides of its rear portion or body**.

The rear incident gases induce a rotation on the projectile while the projectile is still in the gun barrel. Once the projectile leaves the gun barrel, the front incident air induces rotation in the opposite direction and flips the sense of projectile rotation in the other direction because the **passages or grooves respond differently to front incident air as compared to rear incident air. This switch in the sense of projectile rotation after it leaves the muzzle creates instability and tumbling**.

In contrast, the projectile in the present invention starts spinning after leaving the muzzle and does not have this switch in projectile rotation. Thus, **Russell does not capture the essence of the present invention as a whole.**

Furthermore, **Russell** generally discloses passages or grooves in both the head and rear sections of the projectile. Hence, **spin is induced from both the head and rear sections, requiring very precise balancing** of the spins to achieve and maintain dynamic balance in flight.

In contrast, the **present invention as recited in claims 13 and 14, includes a rear stabilizer that uniquely determines the projectile spin.** There is no need to balance multiple spins while in flight.

In addition, **Russell** generally describes a projectile with **passages** or grooves **in the** nose and rear sections, and an **annulus in the cylindrical** portion connecting the nose and rear. The **complex features** require substantial material removal in machining and **expensive** manufacturing.

In contrast, the **present invention does not require the presence of the annulus** in the cylindrical portion **and passages** in the nose. It has a large diameter over the length of the projectile to **maximize stiffness with inexpensive material** and **less complex features**, requiring less material removal in machining and results in **less costly** manufacturing.

Moreover, **there is no teaching, suggestion, or motivation** to modify Russell to incorporate the features recited in the claims on file, particularly claims 1, 13, and 14, which were discussed earlier.

Consequently the claims on file are not obvious in view of Russell, and are thus allowable.

CONCLUSION

All the claims presently on file in the present application are in condition for immediate allowance, and such action is respectfully requested. If it is felt for any reason that direct communication would serve to advance prosecution of this case to finality, the Examiner is invited to call the undersigned at the below-listed telephone number.

Respectfully submitted,

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